SECTION 3: DEFINITION OF ALTERNATIVES

Alternatives for the Central Avenue Corridor include technology alternatives, alignment alternatives, and the Baseline alternative. Technology alternatives considered for the RTP were based on alternatives advanced from the Middle Rio Grande Connections Project. A summary of the technology and alignment options considered by the RTP for the Central Avenue Corridor is provided in this section.

3.1 Technology Alternatives

As used in this document, transportation technology refers to the type of high-capacity transit vehicles and services that can be used to transport large volumes of people. These include technologies such as light rail, monorail, commuter rail, streetcars, trolleys, bus rapid transit, and others. The technologies considered for the RTP were identified by the Middle Rio Grande Connections Project. That project, which was completed in mid-2001, evaluated a wide-range of high-capacity modes and strategies—including both developing and established technologies in use throughout the world.

One objective of the Middle Rio Grande Connections Project was to identify the high-capacity transit technologies that best match the needs and conditions of the Albuquerque region. Based on an assessment of local conditions and needs in combination with public input, two primary high-capacity transit technologies were identified as best suited for the needs of this region. These technologies are light rail transit (LRT) and Bus Rapid Transit (BRT). The recommendations of the Middle Rio Grande Connections Project were adopted by the Urban Transportation Planning Policy Board — the appointed regional transportation board of the Mid-Region Council of Governments. Detailed information about the selection of technologies used for the RTP can be found in the document Middle Rio Grande Connections Final Summary Report, April 2001.

Bus Rapid Transit

Bus rapid transit is a relatively new type of high-speed bus operation that offers premium transit service using modern buses. The operation and level of investment for BRT covers a broad range of systems. One approach to BRT consists of standard forty-foot low-floor buses operated in mixed flow traffic lanes. Incremental travel time improvements for buses result from several strategies including changes to bus operations, equipment, and passenger amenities. Operational strategies primarily involve: reducing the number of stops by spacing stations at intervals of one-half to one mile and increasing the frequency of service to make the service more accessible and attractive. Changes to equipment include: the use of modern low-floor buses to facilitate quicker passenger boardings and

Rapid Bus in Los Angeles, California

alightings; the use of articulated buses to increase passenger capacity; and the use of bus priority signal systems to reduce the delay time at intersections. Passenger amenities are intended to make the service more attractive to riders and include: attractive stations; message boards that communicate with on-board vehicle locating technology to provide minute-by-minute updates on the status of arriving buses.

BRT System in Curitiba, Brazil

Another operational strategy for BRT consists of articulated low-floor bus vehicles operated in separate guideway dedicated exclusively for buses. Buses are typically equipped with automatic docking systems to operate much like light rail vehicles. In addition, passenger boarding is expedited with off-vehicle ticketing machines located at the station.

The cost for implementing BRT systems can range from as little as $3 million per mile for very basic systems and up to $20 million per mile or more for elaborate systems.

For the purposes of this alternatives analysis report, the BRT system consists of a fully dedicated median guideway system and stations with platforms, shelters, and off-bus ticketing using articulated low floor buses. Buses would be equipped with transponders to communicate with passenger information boards and would provide "Next Bus Arrival" times at each station. Street intersection signal traffic controllers would be upgraded to accommodate a bus signal priority system. Stations would be spaced at intervals of about one mile. Variations of this concept, such as some mixed-flow operation or different type vehicles, will be evaluated in detail in subsequent phases of this project where more detailed engineering and operating characteristics will be developed and evaluated.

Light Rail Transit

Light rail transit consists of electric rail cars operated on tracks in dedicated rights-of-way, generally in the middle of a street, with specially designed stations spaced at intervals of about one mile. LRT systems are capable of transporting very large volumes of passengers quickly.

LRT in Portland, Oregon

Light rail transit is generally more flexible than other rail systems. Where necessary, it can be operated in mixed flow lanes on city streets, in barrier-separated lanes on urban arterials, in freight railway corridors, or on its own exclusive track. It uses electrically powered rail cars. On a per mile basis, the capital costs for

implementing light rail transit in the United States has typically ranged from $25 million per mile to $65 million per mile or more. These costs are based on recent LRT projects constructed in other western cities and include purchase of rail vehicles, right-of-way acquisition, construction of a specialized maintenance facility, guideway system, associated electrical system, stations, park and ride lots, traffic signal systems and other similar components of rail systems.


LRT in San Diego, California

The LRT system assumed for the RTP consists of an at-grade guideway system and stations with platforms, shelters, and off-train ticketing. The vehicles used would be 90-foot low-floor articulated vehicles with overhead catenary electric power distribution. Stations are assumed to be located at intervals of about one mile.

General Operating Plan Assumptions

The operating characteristics for the various premium transit services are used as the basis for estimating ridership projections, implementation and operating costs, and cost-benefit calculations. For this reason, the operating characteristics of each system must be identified before the analyses can be conducted. Operating plans for the alternatives being evaluated by the RTP were developed by the project team. As a starting point, a transit service objective that reflected the Centers and Corridors adopted policy was established — to emphasize rapid and efficient transit service between the Northeast Heights, UNM/TVI, Downtown, and the West Side. Next, existing service plans and data maintained by the Albuquerque Transit Department were evaluated including a review of existing routes and types of service and their operations. Finally, on-board surveys[1] were conducted to identify and verify route operating characteristics and passenger boarding and alightings and to determine the travel needs of transit riders. From these data, operating plans for the various alternatives were developed.

Each alternative technology shares the same basic operating plan. The key operating characteristics of the proposed system are discussed below and summarized in Table 6.

- The service will operate every day for 18 hours per day. In general, service will begin at 5:30 a.m. and run through 11:30 p.m.
- Operating headways for the rapid transit vehicles will be 6 minutes during peak periods (i.e., between 6:00 a.m. and 9:00 a.m. and between 3:00 pm and 6:00 pm), 12 minutes during the off-peak (between 9:00 am and 3:00 pm) and 15 minutes in the evening.

1 The passenger data were obtained from an on-board study conducted specifically for the RTP and included data collected on May 7-8, 2002 and July 16-17, 2002. The survey had a 95% confidence interval and an error ratio range of +/-10%. The major findings of the surveys is provided in Appendix B.

Table 6: Assumed Operating Characteristics for Rapid Transit Alternatives	
Descriptive Information	**Statistic**
Rapid Transit Alternatives	
Stations	10 to 12, depending on the alternative
Park-and-Rides	2
Estimated travel speed	approx. 22 or 25 MPH when operated in a separate guideway depending on the technology.
Operating Parameters	
▪ Weekdays	253 days per year
▪ Saturdays	52 days per year
▪ Sundays and holidays	60 days per year
Service Hours	
▪ Weekdays	5:30 AM to 11:30 PM
▪ Saturdays	5:30 AM to 11:30 PM
▪ Sundays	6:00 AM to 11:00 PM
▪ Peak hours per day	6:00 AM – 9:00 AM and 3:00 PM - 6:00 PM
▪ Evening Service	6:00 PM to 11:30 PM
▪ Peak hour headway	6 minutes
▪ Off-peak hour headway	12 minutes
▪ Evening and Sunday headway	15 minutes
Local Service Frequencies along Rapid Transit Route	
Peak hour headway	15 minutes
Off-peak hour headway	20 minutes
Evening headway	30 minutes
Effective Corridor Headways along Rapid Transit Route (Rapid Transit service plus local Route 66 or Route 11 service)	
Peak hour headway	4.5 minutes
Off-peak hour headway	7.5 minutes
Evening headway	10 minutes

- Operating headways for local bus service operating within the rapid transit corridor will be 15 minutes in the peak period, 20 minutes in off peak periods, and 30 minutes in the evening.
- To achieve the assumed headways, a total of 12 LRT vehicles and 15 BRT vehicles will be required. Of these a maximum of 10 LRT vehicles and 12 BRT vehicles will be in operation with the remainder used as spares
- Buses for the BRT alternative will be low-floor, articulated buses with a seating capacity of 60 passengers and a maximum capacity of 80.
- Rail cars for the LRT system will be electrically powered low-floor vehicles with a seating capacity of 100 passengers and a maximum capacity of 192 persons. LRT rail cars would

initially be operated as single car trains, but can be doubled or tripled as passenger demand warrants.

- The rapid transit alternative (rail or bus) will operate in semi-exclusive right-of-way (an exclusive lane with at-grade intersections) wherever possible. Where this is not possible, the service will be operated in mixed traffic.
- The system average operating speed is 25 miles per hour for LRT and 22 miles per hour for BRT, including station dwell time and passenger loading time.
- Local bus service on the existing north-south bus lines would be restructured to provide an efficient collector-distribution system to support the rapid transit service.

3.2 Alignment Alternatives

Numerous alignment alternatives specific to the Central Avenue Corridor and Louisiana Boulevard Corridor were identified at the onset of the alternative analysis process, all of which follow existing street rights-of-way and generally follow existing transit routes. Based on an initial scoping assessment of the various routes by the project team, several were identified as impractical and therefore eliminated from further consideration. The elimination of routes was based on the lack of suitable right-of-way and intrusion into neighborhoods. These included routes that utilized portions of Lead and Coal Avenues, Monte Vista Street, and Las Lomas Road. Subsequent to the initial scoping assessment, four alignments were presented to the study team and at community meetings. Comments from the study team and public resulted in the development of a fifth alignment. Each of the alignment alternatives is described below and illustrated in Figure 8 on the following page.

Alignment Alternative 1: Central Avenue/Louisiana Boulevard

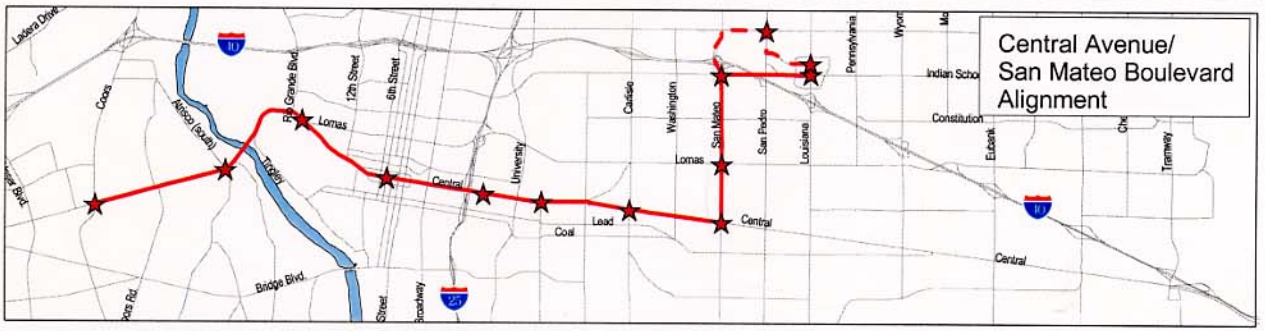
This alignment starts on west Central Avenue at Coors Boulevard (see Figure 8). From this point, it extends easterly following Central Avenue to Louisiana Boulevard. At Louisiana Boulevard, the alignment turns north and follows Louisiana Boulevard to its terminus at Uptown Boulevard. The total length of this route is 10.7 miles.

The Central Avenue/Louisiana Boulevard alignment includes ten stations located at approximately 0.8 miles to 1.5 mile intervals. Stations would be located near the intersections of Central Avenue and Coors Boulevard, Atrisco Plaza, Old Town, Downtown, Presbyterian Hospital, University of New Mexico, Nob Hill, Hiland Center, NM State Fairgrounds, and at the intersection of Louisiana Boulevard and Uptown Boulevard.

Alignment Alternative 2: Central Avenue/Tramway Boulevard

This alignment starts on west Central Avenue at Coors Boulevard (see Figure 8). From this point, it follows Central Avenue to its terminus at Tramway Boulevard at the eastern edge of the urban area. The total length of this route is 12.8 miles.

This alignment includes twelve stations. For the portion of Central Avenue between Coors Boulevard and Louisiana Boulevard, the station locations are the same as described in



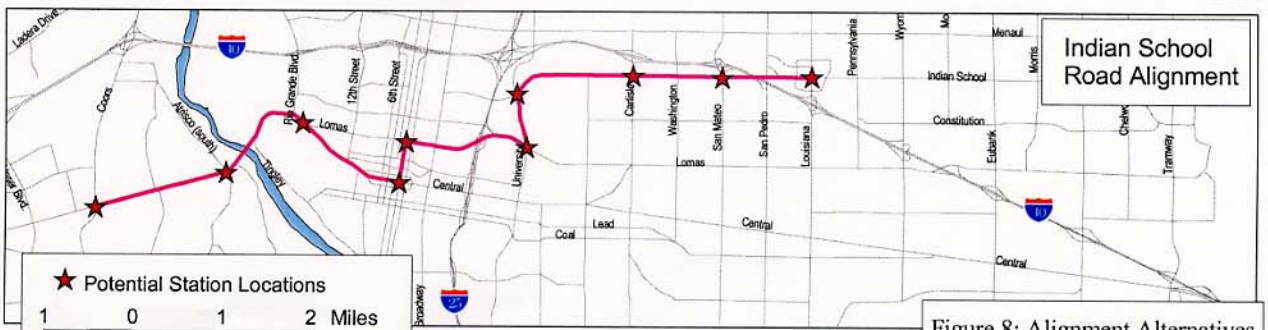


Figure 8: Alignment Alternatives

Alignment 1, above. The additional stations are located on Central Avenue at Wyoming Boulevard, Eubank Boulevard, and near Tramway Boulevard.

Alignment Alternative 3: Central Avenue/San Mateo Boulevard

This alignment starts on west Central Avenue at Coors Boulevard (see Figure 8). It follows Central Avenue to San Mateo Boulevard. At San Mateo Boulevard, the alignment turns north and follows San Mateo Boulevard to Indian School Road. It turns east at Indian School Road and follows this road to just west of San Pedro Drive. At this point, the alignment would continue almost due east across Interstate 40 and enter Uptown on Indian School Road. For preliminary analysis purposes, the alignment was assumed to utilize the alignment for Indian School Road as it existed prior to the construction of I-40 and subsequent realignment of Indian School Road. The alternative alignment terminates at Louisiana Boulevard and has a total length of about 10.5 miles.

As an option to using Indian School Road, an alignment using Menaul Boulevard is included in this alternative. This optional route would follow San Mateo Boulevard to Menaul Boulevard. At Menaul Boulevard, the route would turn east and follow Menaul to San Pedro. At San Pedro Drive, the alignment runs south to Uptown Boulevard which it then follows Louisiana Blvd.

The Central Avenue/San Mateo Boulevard alignment includes eleven stations. For the portion of Central Avenue between Coors Boulevard and San Mateo Boulevard, the station locations are the same as described in Alignment 1, above. The additional stations are located on San Mateo Boulevard near its intersection with Lomas Boulevard and Indian School Road, and a terminal station located near the intersection of Indian School Road and Louisiana Boulevard.

Alignment Alternative 4: Central Avenue/Lomas Boulevard/Louisiana Boulevard

This alignment is the same as the Central Avenue/Louisiana Boulevard alignment up to its intersection with 3rd Street in the Downtown area (see Figure 8). At 3rd Street, the route would turn north on 3rd Street to Lomas Boulevard. At Lomas Boulevard, the route would turn east and follow Lomas to its intersection with Louisiana. At this point, the route would again be the same as the Central Avenue/Louisiana Boulevard and would terminate in Uptown. The total length of this route is 10.3 miles.

As an option to using Central Avenue between Old Town and Downtown, this route could follow Lomas Boulevard from its intersection with Central Avenue in Old Town to 3rd Street.

This alignment would include ten stations. Stations would be located near the intersection of Central Avenue and Coors Boulevard, Atrisco Plaza, Old Town, Downtown, north Downtown, north UNM, at locations near the intersections of Lomas Boulevard and Carlisle Boulevard, San Mateo Boulevard, and Louisiana Boulevard, and at the route terminus in Uptown.

Alignment Alternative 5: Central Avenue/Lomas Blvd./Indian School Road

The Indian School Road alignment follows the same route as the Lomas Boulevard/Louisiana Boulevard alignment from its start at Central Avenue and Coors Boulevard to the intersection

of Lomas Boulevard and University Boulevard (see Figure 8). At University Boulevard, the route would turn north and follow University Boulevard to Indian School Road. At Indian School Road, the alignment would follow Indian School Road to a point just west of San Pedro Drive. At this point, the alignment would continue almost due east across Interstate 40 and enter Uptown on Indian School Road following an old alignment of Indian School Road that existed prior to the construction of I-40. The alignment would terminate at Louisiana Boulevard and has a total length of about 10.1 miles.

Stations along this route would be located near the intersection of Central Avenue and Coors Boulevard, Atrisco Plaza, Old Town, Downtown, north Downtown, north UNM, at locations near the intersection of Lomas Boulevard and University Boulevard, University Boulevard and Indian School Road, and Indian School Road near Carlisle Boulevard, San Mateo Boulevard, and Louisiana Boulevard.

3.3 Typical Sections

The initial assessment of impacts was based on a guideway system located in the center of the street (street median). In general, a median-operated guideway for either BRT or LRT requires a width of approximately 26 to 28 feet. This width is adequate to accommodate two bus lanes or train tracks plus a narrow center barrier to separate vehicles and to provide room for the installation of electrical power poles and catenary lines. At station locations, the median width would be increased to approximately 40 feet to allow approximately 16 feet for the station platform. The typical section for a median guideway system is illustrated in Figure 9 on page 27.

3.4 Stations

Stations and park-and-ride lots are assumed for each of the alignment alternatives. Station locations were selected based on four criteria: (1) access to activity centers; (2) proximity to transfer points with major connecting routes; (3) consistency with existing major boarding locations; and (4) potential synergy with existing transit-oriented developments. Each of the alignments has between 10 and 12 stations, depending on route length. The distance between stations is approximately one mile.

It should be noted that the identified station locations are for planning purposes only. The actual number, spacing, and location of stations will be modified and refined by subsequent phases of the RTP as additional engineering and modeling data become available. While some modifications will occur, it will be important to maintain a spacing interval that facilitates operating speeds that are conducive to high-capacity transit service.

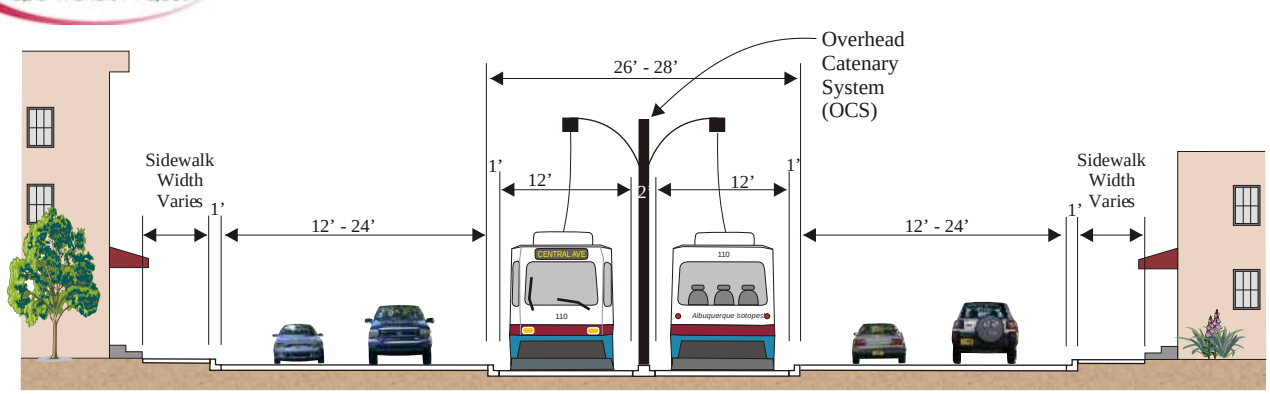
Example of BRT/LRT Station

The number and approximate location of stations for each alignment alternative are described in the preceding section and illustrated in Figure 8 (see page 23). The aesthetic design of stations will be developed in collaboration with the neighborhoods, businesses, and other stakeholders at each location. It is anticipated that the design will vary throughout the corridor with each station matching the particular theme of the surrounding area.

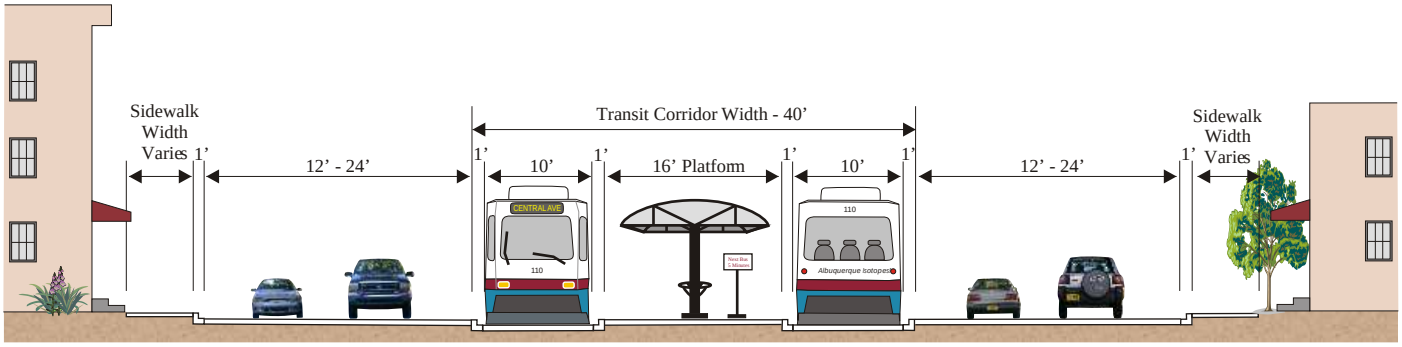
3.5 Park-and-Ride Locations

Two park-and-ride or shared parking lots are assumed for each alignment alternative at the initiation of service. These parking lots are essential to the success of high-capacity transit because they expand the area from which transit riders can be attracted. Typically, the tributary area for a park-and-ride station is approximately 2 to 5 miles. Transit riders are able to drive to transit stations, park, and use transit to access their final destination.

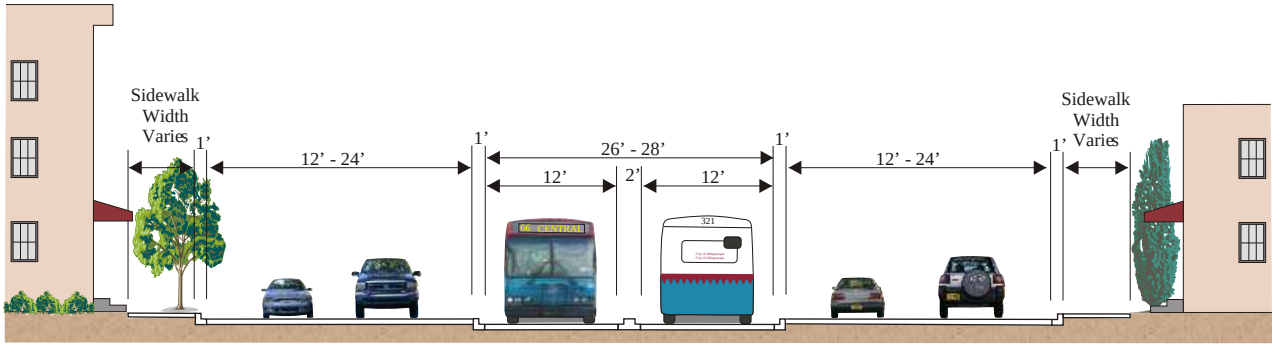
For evaluation purposes, park-and-ride or shared parking lots are assumed to be located near the terminal locations of each alternative or, alternatively, at strategically located sites that will aid in improving access to the high capacity system. Each lot would include approximately 250 parking spaces, a passenger pick-up and drop-off area, and a transit boarding station. Two general locations are proposed: at the west terminus and at the east termini of the alignment alternatives. At the west terminus, the lot would be located in the vicinity of Central Avenue and Coors Boulevard. The location of the lot at the eastern termini would vary depending on which alignment alternative is selected. In the Uptown area, approximately 250 shared parking spaces are assumed in the vicinity of the intersection of Louisiana Boulevard and Uptown Boulevard or they could be divided between the Uptown area and a location near the State Fairgrounds. Regardless of the location, the lots could involve either new construction or the use of existing parking areas.



Median LRT



Median LRT with Station



Median BRT

Figure 9: Guideway and Station Typical Sections